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ABSTRACT

This case study describes a distance learning experience from the point of view of a first time instructor and the students (elementary school teachers) enrolled in a graduate-level science education course at Morehead State University (Kentucky). Many of the students were from isolated areas in Appalachia. The paper concludes that participants were pleased with the distance education course. All students felt that their educational experience was enriched by their involvement with technology and collaboration with teachers from different locations. Suggestions for future improvement are discussed. (Contains 17 references.) (WRM)

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REACHING OUT TO TEACHERS IN APPALACHIA VIA DISTANCE EDUCATION

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Introduction to Distance Learning

> I find distance learning to be both fascinating and aggravating. I have enjoyed learning how to use the equipment and learning how to use PowerPoint. Distance learning is also a great way to share ideas with a larger group of educators than would be possible in a single classroom setting.
>
> I find it aggravating at times...due to technical difficulties.
>
> Jacqueline[1], a distance learning student.

As this student quote states, the distance learning experience can be mixture of both positive and negative experiences. Learning from a distance, using compressed video, Internet connections, and other communication technologies, has found a place within education. This study has endeavored to create a picture of the distance learning experience from both the perspective of a first time instructor and the students enrolled in a graduate level science education course.

A number of investigations evaluating televised instruction in terms of student performance are common (Wetzel, Radtke, & Stern, 1994; Delbeq & Scates, 1989; DeLoughry, 1988; Moore and & Thompson, 1990; Souder, 1993; Stone, 1987, 1988 Cohen, Ebeling, & Kulik, 1981). In general the findings of these research studies indicate that students taking televised courses at remote sites perform as well as their counterparts taught in traditional classrooms. Most of the research on distance education provides "snap-shot" profiles of student

1 The names of all people in this paper are pseudonyms.

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content learning and/or student attitudes. Studies which extend over the duration of a course1 are rare. Both cross-sectional and longitudinal assessments of student participants and distance education programs are necessary to evaluate the effectiveness of programs and to provide guidance for future development (Westbrook, 1997; Biner, 1993; Sachs, 1993; Eagen,. Welch , Page, & J. Sebastian , 1992). Also, in comparison with other distance learning topics, the degree of student satisfaction with education at remote sites has been neglected by researchers (Biner, 1993). On-going assessment of distant learner satisfaction can have far-reaching benefits--lower attrition rates, increased student motivation, increased student-generated referrals, and enhanced learning (Biner, Dean, & Melliger, 1994).

Background of the Study

Distance Education at Morehead State University, which operates via a fiber optic telecommunications system, has grown from one class delivered to seven sites, Fall semester 1995, to more than 29 classes delivered to eighteen sites, involving more than 23 faculty members and 622 students. The university utilizes a fully interactive telecommunications system that provides full motion video (compressed) and audio transmission. On-campus and off-campus students interact using either a voice activated microphone or a push-to-talk microphone. The instructor aided by a site facilitator at the origination site controls the delivery of course content and communication among sites by using a touch-controlled computer panel. All sites employ a site facilitator who operates the technology, acts as a liaison between the students at the remote site and university faculty, and performs class management duties, such as taking attendance, distributing materials, and proctoring quizzes and tests. The instructor makes periodic visits to each remote site in order to establish personal contact with the students.

Technologies present at each site include teacher and student cameras, a computer located at the podium for the use of the instructor, student computers, an overhead camera for display of class materials and a minimum of two monitors All classes transmitted are video-taped and made available to students.

Purpose of the Study

The primary goal of this investigation was to chronicle the experiences of an instructor and her students as they first experience a course delivered at a distance utilizing various technologies. Both the instructor and students had no or very limited experience with e-mail, Internet use, and supporting software. The challenge was to learn and utilize the technology without a reduction in course content.

According to Bullough, Knowles and Crow (1992) and Yin (1989) case studies are valuable when investigating situations where the researcher has little control in real-life situations. This method enables the researcher to preserve the integrity of the subjects' experiences and meanings, as well as encouraging sensitivity to changes within the context of the experience without being narrowly bound to preconceived courses of experimentation.

Methods

The instructor, Dr. Kern, is an assistant professor who has been with the university for 2 years. The students are 33 elementary teachers taking a graduate level science education course, Science 690: Advanced Science for the Elementary Teacher, which is a requirement for the Masters' Degree and the Fifth Year Program.

The Site

Morehead State University is a regional university that services the Appalachian region of Eastern Kentucky. The lack of major highways and weather conditions in the region cause the

area to remain isolated. The students are distributed among five sites--main campus and four public schools in rural Eastern Kentucky.

Sources of Data

Data was gathered from the instructor and student journal entries, videotapes of televised classes, and student surveys given at three different times --after the first 3 weeks of class, at the midpoint of the semester, and at the end of the semester.

Results and Discussion

Launching the New Semester.

The following entry from Dr. Kern's journal speak of her impressions after her first encounter with a *real* distance learning class.

> I felt good about the class, but I felt removed from my students. Unless I call on a specific site there is no feedback or response. I felt so alone and the equipment makes a physical barrier between myself and the students in the room.

At the beginning of the course the students expressed appreciation for the opportunity to take Science 690 at a location within driving distance of their home. Many stated that if the course had not been offered through distance learning, they would have been unable to take the course. Although some students were apprehensive about using computers approximately one-third of the class was excited about the opportunity to learn and use the new technologies. Most students were reluctant to speak on camera and remarked in their journals that they were uncomfortable "being on camera.".

> ...when I sat in on my first class, I was a nervous wreck. I didn't realize how

camera shy I really was. The whole time during our first meeting I kept saying to myself, "I'm never sitting in the front row again." I felt really uncomfortable with the idea that I was on television.

Teaching a course via distance learning requires a high degree of organization, constant communication with the site facilitators, many hours of work preparing class presentations and activities, and a real effort to know the students. Typical planning for one distance learning class involves: first, planning the class at least one week in advance and making up packets for each site; second, making arrangements to have the materials sent to each site; third, contacting each site facilitator and discussing the next class; and fourth, planning a alternate activity in the event of technical failure and making back-up disks and "hard" copies of all presentations.

Visits to the remote sites.

In addition to the planning mentioned in the previous section, the instructor needs to determine the availability of equipment and the compatibility of computer programs when broadcasting from a remote site.

Most of the distance learning sites located in the public schools are new. The site facilitators (employees of the school district) are often inexperienced, but try to meet the needs of both faculty and students. The university works with the schools to train the site facilitators. But at the beginning of the semester these individuals are often struggling with the technology.

Traveling to the various sites is time consuming and expensive but Dr. Kern noted that after her visits the students were more willing to "come on camera" to ask questions or to participate in discussions. The students also increased e-mail conversations with her.

Because of the smaller groups a professor's visit can be more of a personal getting acquainted time, as opposed to a large class on campus.

The Return to Campus.

Being on the road had its effects on the campus class, as evidenced by Dr. Kern's journal entry when she returned.

> March 12th I was back at Morehead. I felt that much of the good rapport I had established was beginning to erode. They now felt like a new class. The ones that I communicate with on e-mail still seem close, but those who won't do it seem removed. In the future e-mail will be required. If they can't do it, then they don't take the class. But I wanted so much for the class to succeed that I gave them several options. The ones that rely on faxes I have a harder time giving feedback.

Mid-Semester.

After the first half of the semester Dr. Kern related that the hardest part of the class was her feeling of isolation. Although she had a group of students in the room, the equipment (document camera, control panel, monitors) was a barrier between her and the students. As she became more familiar and at ease with the technology she made a real effort to use the portable microphone and move around the room. This change was possible because the site facilitator could manipulate the cameras and the control panel. Another difficulty was perceiving how the class was proceeding at the remote sites.. If everyone was quiet the site was not seen because each site is voice activated. Some students voiced their own feelings of isolation from the instructor and other class members.

> I don't think you know me as well as you would have had we been in a traditional setting.
>
> I enjoy getting to know everyone in class and have not been able to do so through

distance learning. I believe I have missed an opportunity to meet several new friends and share many other experiences.

Each class had to be well planned and organized, especially when the *hands-on* science activities were on the agenda. Discussions were hard to initiate and Dr. Kern felt that it took longer to "do things " via distance learning. She had to make a real effort to wait for responses because of additional wait time between her questions and student responses. This phenomena became apparent when she made a humorous remark. Laughter was heard from a remote site after she moved to another topic. Also, when the class time expired, transmission ended.

Student Presentations

Student presentations gave students not only the opportunity to demonstrate their mastery of the subject but also provided the experience of being on camera and using the equipment, which helped them overcome their stage fright..

> The students gave presentations tonight. Each one did more than I asked for. They also said that they had a new respect for what I did after they had to manipulate the equipment.

Manipulation of the cameras and microphones was an added challenge for student presentations.

> I had to be on my toes at all times watching the monitor and making sure that what we were doing was being broadcast. Displaying handouts under the document camera; having a group of students work under the document camera; and making sure no water or other materials come close to any of the equipment is a real challenge…They (the presentations) don't quite have the impact as if you (the students at the remote sites) were actively participating.

Despite Dr. Kern's reservations several students indicated that the presentations were a valuable part of the class and worth the extra effort.

> I have picked up a number of ideas from my peers at Centerburg, and from the students at other sites through our presentations.

Student Involvement

Dr. Kern did strive to have a distance learning class as close to her traditional Science 690 class as possible. She began and ended each class with a hands-on science activity and involved the students in class discussions and cooperative learning strategies such as jigsaw. Special arrangements had to be made to send materials to remote sites, students had to bring in materials, and extra planning and organization of activities and materials was needed (e.g., water, liquids and particles had to be kept away from the equipment.). Some early attempts were disappointing and the more vocal students expressed displeasure when their classmates were reluctant to participate.

> ...some people are a little backwards at the beginning of a class and do not talk much. For those people the thought of having so many other locations on line at the same time just makes matters worse for them and leaves us, who do not care to talk, doing all the talking.

For other sites student participation was less of a problem and the initiation and management of student activities and discussions improved with time.

> We also did more cooperative learning. Having the students in groups with each having a role works well --director, recorder, and spokesperson.

Student Satisfaction

Student satisfaction with the class was closely related to the number of students at each

site. Students attending sites with three and four students stated that they had established a close working relationship with the other students at their site.

> This class allows for a lot of cooperative learning. We depend on ourselves and each other. This is a student directed class …and we are suppose to be doing that with our own classes…there are only four of us but I feel that we are closer than any of my other classes.
>
> I personally like the small class size because it is not as intimidating as large classes.
>
> When I'm giving a presentation I only see 6 or 7, not 30 or so.

A student on campus (8 students at the site) reported that most of his classes contain 25 to 30 students. In these classes he normally sits at the back of the room and rarely, if ever, speaks to the instructor or other students. He said he felt comfortable participating with the smaller group in the distance learning class. With encouragement from the other students he often spoke on camera. Students at the site with the largest enrollment--13 students-- did not report the same feeling of closeness with other students.

Epilogue

At the end of the semester Dr. Kern voiced her excitement for the doors that distance learning can open, especially for the population she needs to reach--teachers in Appalachia.

> Teaching via compressed video is very demanding--both in time and in effort.
>
> It is worth the investment for the teachers that we need to reach.
>
> One of the problems in education is that once teachers are out in the schools, they shut their classroom doors and are isolated from their peers. This problem is compounded here in rural Kentucky. There are no major highways connecting

many of the areas and weather conditions--snow in the mountains in the winter and heavy spring rains--further complicate the problem. Distance education via compressed video is one medium that can bring teachers together. I've always felt that the strength of this class is not what they gain from me, but what they gain from one another.

A student survey at the conclusion of the course indicated that students were generally pleased with their experiences in distance learning and Science 690. Everyone indicated that they would take another distance learning class and all. but one student, would recommend distance learning to others. Students gave the following reasons for enrolling in a future distance learning course (in rank order):

1. Close to home/work and require less travel.

Previously unavailable courses are now accessible.

2. Working with other students in smaller groups.

3. Opportunity to learn new technologies.

4. Opportunity to share/learn from other students (teachers) at different locations.

5. More involved in own learning and therefore, learned more.

When students were asked what they valued most about Science 690, they were evenly divided between the hands-on science activities and the use of technology. The distance learning feature most valued was sharing with the teachers at other sites. This answer ranked above the convenience of taking a course close to home/work or taking a course normally unavailable.

I like the idea that I get to see the people from the other sites. I think that it is wonderful that so many of us can be reached through distance learning.

The least valued features were not associated with the distance learning aspect of the

course. They were divided among assigned readings, the textbook, and lab reports. Although students stated early in the semester that the one distance learning feature they did not like was being on camera, at the end of the semester only four students listed this aspect as a problem. Thirteen students listed technology problems, especially sound quality as a major problem. Other concerns listed (in order) included: the amount of time wasted while setting up student presentations, not enough courses offered through distance learning and less teacher contact. The number of students expressing concern about the amount of teacher-student contact declined as the semester progressed. Students who actively used e-mail to send assignments and correspond with the instructor felt they had more interaction with the instructor and feedback on their assignments than in traditional classes.

Conclusion

Distance learning is a vehicle for reaching students isolated by distance, geographical barriers, or life circumstances. It is more than a convenience for students in our service region. It is a necessity. Courses that normally are inaccessible to the Appalachian population are now within reach.

Distance learning at Morehead State University is currently in its third year. Since Spring 1997, when data was collected for this study, facilities have been expanded and many improvements have been made in technology, communications, support and training of faculty and support staff.

This particular study followed a professor and a group of elementary teachers enrolled in a graduate level science education course. The subjects selected are a group of professionals who are charged daily with taking control and directing learning situations. At each site students--usually teachers with classroom experience--emerged as leaders. Therefore, the results

of this study are not generalizable to other distance learning populations, especially undergraduates.

All students felt that the educational experience was enriched by their involvement with technology and collaborating with teachers from different locations.

> I feel I've learned just as much material and actually gained more teaching ideas than I would have in a traditional class setting by listening to and watching the presentations of other teachers from so many different places.

> The class has made me become a more independent learner-a goal I strive to have my own students achieve, it has made me become a better listener and helped make me more responsible for my learning.

Distance learning is not without its problems. It is very easy to get "caught up" in the technology with the result being that it drives the class. Too much time can be taken away from course content teaching students how to use equipment and software packages. This problem can be alleviated through separate workshops and help sessions supported or sponsored by the college or university. When planning the instruction the professor needs to first set his/her content goals and then determine how the technology can help him/her achieve that result.

As with any job involving equipment there is always the possibility of a technology failure. The likelihood of such an occurrence diminishes with the quality of the equipment. The problems associated with the system have mainly occurred at sites which have economized by purchasing less expensive microphones, monitors and cameras. But even with quality the unthinkable can happen. Therefore, it is essential to have a back-up plan and an alternate lesson that the site facilitators can deliver to the students.

In a learning situation where the instructor is not physically present, it is easy for both the students and the instructor to feel isolated from the other. This problem can be alleviated by the use of the *Nicenet* network, *Course Information* system, and other Internet or software programs that have class conferencing, discussion groups and/or virtual chat room features along with the use of e-mail.

The delivery of materials to and from the remote sites must be considered before planning a distance learning class. The delivery system available- United States Postal Service, United Parcel Service or Courier-will have a direct effect on the class activities, the work assigned (e.g., portfolios, resource notebooks) and due dates.

Distance learning is not easy. It involves much hard work and commitment on the part of the instructor, students who are willing to give it a chance, and a support system from the post-secondary institution. Teaching from a distance is challenging bŭt it also has its rewards, as evidenced by the following journal entry of a student.

> The technology in our schools for teachers and staff is very limited. So using the distance learning facility was quite a challenge. Since beginning the distance learning class my team teachers and I have pushed our school to get us on line and up to par with the rest of the world. We now have e-mail available... E-mail and the Internet have opened a variety of services and facilities for us. I have acquired dozens of lesson plans and Internet addresses to use. I now use research from the Internet with my students.

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